AMENDMENTS TO THE SPECIFICATION

The specification has been amended as follows:

Page 1

The following new heading has been added before line 1:

BACKGROUND OF THE INVENTION

The heading at line 1 has been amended as follows:

1. FIELD OF THE INVENTION

The heading at line 7 has been amended as follows:

~~BACKGROUND OF THE INVENTION~~ 2. DESCRIPTION OF THE RELATED ART

Page 5

The paragraph at lines 21-36 has been amended as follows:

The discharged particulate amount calculating unit calculates an amount of particulates discharged in a given time period during which the excess air ratio is ~~equal~~ equal to or less than the predetermined value. The burnt particulate amount calculating unit includes a burning velocity calculating section which calculates a velocity for burning particulates on the particulate filter on the basis of the filter temperature frequency at which the temperature of exhaust gas in front of the particulate filter or the temperature of the particulate filter is equal to or higher than the predetermined value, and derives an amount of particulates burnt in the given time period on the basis of the particulate burning velocity in the given time period and the amount of particulates

accumulated in the given time period. The particulate accumulation amount calculating unit calculates an amount of currently accumulated particulates on the basis of the amount of previously accumulated particulates, the amount of particulates discharged during the given time period, and the amount of burnt particulates in the given time period.

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The paragraph at lines 1-12 has been amended as follows:

The amount of particulates burnt in the given time period is calculated on the basis of the particulate burning velocity in the given time period and the amount of previously accumulated particulates. The amount of particulates discharged in the given time period is calculated on the basis of the excess air ratio frequency at which the excess air ratio is ~~equal~~ equal to or less than the predetermined value in the given time period. Further, the amount of currently accumulated particulates is calculated on the basis of the amount of previously accumulated particulates, the amount of particulates accumulated in the given time period, and the amount of particulates burnt in the given time period. Therefore, the amount of currently accumulated particulates can be precisely detected, which is effective in properly setting up the forced regeneration intervals.

Page 8

The multiple paragraphs at lines 3-19 have been amended as follows:

~~Fig. 3(a)~~ Fig. 3A shows a map for estimating an amount of discharged particulates on the basis of an excess air ratio.

~~Fig. 3(b)~~ Fig. 3B shows a map for estimating a particulate burning velocity on the basis of a filter temperature frequency at which a filter or exhaust gas temperature is equal to or higher than a predetermined value.

~~Fig. 3(c)~~ Fig. 3C shows a map for easy estimation of a burning velocity coefficient on the basis of the filter temperature frequency, the burning velocity coefficient being used at the time of forced regeneration of a filter.

~~Fig. 4(a)~~ Fig. 4A shows a map for explaining time-dependent variations of an excess air ratio frequency at which the excess air ratio is equal to or less than a predetermined value, used for forced regeneration of the filter.

~~Fig. 4(b)~~ Fig. 4B shows a waveform of a moving weight average of the excess air ratio frequency.

~~Fig. 5(a)~~ Fig. 5A shows a map for estimating NOx/Soot on the basis of a fuel injection amount and an engine speed.

~~Fig. 5(b)~~ Fig. 5B shows a map for setting up a correction factor K on the basis of NOx/Soot.

The multiple paragraphs at lines 26-32 have been amended as follows:

~~Fig. 9(a)~~ Fig. 9A is a flow chart of a forced regeneration routine of the exhaust gas purifying system of Fig. 8, especially showing a routine for detecting forced regeneration timing.

~~Fig. 9(b)~~ Fig. 9B is a flow chart for calculating an amount of particulates discharged during a given time period.

~~Fig. 9(c)~~ Fig. 9C is a flow chart for calculating an amount of particulates burnt during a given time interval.

Page 10

The paragraph at lines 34-35 has been amended as follows:

The unit A1 calculates the amount M e of discharged particulates on the basis of an excess air ratio λ, and using a map m1 (shown in ~~Fig. 3(a)~~Fig. 3A).

Page 11

The paragraph at lines 4-6 has been amended as follows:

The unit A3 calculates an amount Ma of particulates accumulated on the filter 22 on the basis of the amount ~~Ma~~ Me of discharged particulates and the amount Mb of burnt particulates.

The paragraph at lines 21-28 has been amended as follows:

During the forced regeneration control, the following are calculated: the amount Me of discharged particulates in step s1; the amount Mb of burnt particulates in step s2; and the amount Ma of accumulated particulates in step s3. When the amount Ma of accumulated particulates is ~~equal to~~ greater than a predetermined threshold Maϵ in step s4, the control process is advanced to step s5, where the forced regeneration control will be performed in order to forcibly regenerate the filter 22 (e.g. post-injection control will be carried out for a predetermined time period).

Page 13

The paragraph at lines 32-14 has been amended as follows:

The following data are sent to the fuel injection driver 10: an output Dinj representing the fuel injection amount INJn and the fuel injection timing t1; and an output D'inj representing the post injection amount INJp and the post fuel injection ~~timing 2~~timing t2. Then, the control process returns to the main routine. Thereafter, the fuel injection driver 10 counts unit crank angles Δθ for a predetermined number of times from a reference timing (TDC) till a fuel injection timing θr, carries out the main and post fuel injections J1 and J2. Exhaust gas is heated, hydrocarbon HC is burnt on the oxide catalyst a, the temperature gt of the filter 22 is quickly raised, and particulates are burnt in a hot atmosphere for a time period which depends upon the amount of accumulated particulates. As a result, the filter 22 is reliably regenerated in the forced regeneration process.

Pages 13-14

The paragraph beginning on page 13, line 36 and ending on page 14, line 12 has been amended as follows:

First of all, the unit A1' calculates the excess air ratio λ{=Qa / (Qf ×14.7)} using an excess air ratio calculator al'. A section a2-1' calculates an excess air ratio frequencyγat which the excess air ratio λ is equal to or less than the predetermined value in a given time interval Δt. Referring to ~~Fig. 4(a)~~Fig. 4A, when the excess air ratio λ is equal to or less than the predetermined value (e.g. 1.2), a determination value x is set to 1.

On the contrary, when the excess air ratio $\lambda$is above than the predetermined value, the determination value x is set to 0. Based on the foregoing determination, the excess air ratio frequency γ is calculated using the moving weight average formula (g).

$$\gamma i = (\gamma_{i-1} \times (i - 1) + \gamma i) / i \cdots\cdots (g)$$

where γi denotes an i-th excess air ratio frequency, and γ_{i-1} denotes an excess air ratio frequency prior to the excess air ratio frequency γi .

The paragraph at lines 13-14 has been amended as follows:

Referring to ~~Fig. 4(b)~~Fig. 4B, the excess air ratio frequency γi at the end of calculation in the time period Δt is assumed to be $\lambda\Delta t$.

Pages 14-15

The paragraph beginning on page 14, line 36 and ending on page 15, line 4 has been amended as follows:

For instance, when the excess air ratio shown in ~~Fig. 3(a)~~ Fig. 3A is substituted by the excess air ratio frequency γ, the amount Me of discharged particulates is depicted by a curve opposite to that of ~~Fig. 3(a)~~Fig. 3A, i.e. the larger the excess air ratio frequency γ, the larger the amount Me (or the higher a particulate discharging velocity θ).

Pages 15-16

The paragraph beginning on page 15, line 33 and ending on page 16, line 8 has been amended as follows:

For the foregoing reasons, the filter temperature frequency corrector b2 sets up the NOx/Soot in response to the engine speed Ne and the fuel injecting amount Qf (corresponding to torque) and using the NOx/Soot map m4 in ~~Fig. 5(a)~~ Fig. 5A and a correction coefficient map m5 in ~~Fig. 5(b)~~Fig. 5B, and calculates a correction coefficient Ka on the basis of the NOx/Soot. For instance, if the NOx/Soot is 25 or larger, the correction coefficient K gradually exceeds 1. If the NOx/Soot is less than 25, the correction coefficient K gradually becomes smaller than 1 in response to the reduction of the NOx/Soot. Further, the correction coefficient K is set to be a steady value (<1) when the NOx/Soot is less than 16. Further, the filter temperature frequency corrector b2 multiplies the correction coefficient K with the temperature frequency β, thereby correcting the coefficient K.

Page 16

The paragraph at lines 12-13 has been amended as follows:

The particulate burning velocity coefficient $\alpha\Delta t$ may be derived using the map m2 shown in ~~Fig. 3(b)~~Fig. 3B, in place of the formula (k).

The paragraph at lines 17-22 has been amended as follows:

A burnt particulate amount calculator b4" calculates an amount $Mb\Delta t$ of particulates burnt in the time period Δt using the formula (l).

$$Mb\Delta t = \alpha\Delta t * PM_{i-1} \cdots\cdots \text{ (l)}$$

where PM_{i-1} represents the amount of previously accumulated particulates, which is calculated by the ~~unit A3"~~unit A3' calculating an amount of accumulated particulates as will be described later.

The paragraph at lines 28-29 has been amended as follows:

The ~~unit A3"~~unit A3' calculates an amount PM_i of currently accumulated particulates using the formula (m).

The paragraph at lines 31-35 has been amended as follows:

In the foregoing embodiment, the burnt particulate amount ~~calculator b4"~~calculator b4' of the unit A2' calculates the burnt particulate amount $Mb\Delta t$. Alternatively, the amount PM_i of currently accumulated particulates may be calculated by the ~~unit A3"~~ unit A3' using the formula (n) when the unit A2' is replaced by a unit A2" including the burning velocity calculator b3.

Page 17

The paragraph at lines 1-3 has been amended as follows:

A forced regeneration routine will be described with reference to ~~Fig. 9(a) to Fig. 9(c)~~Fig. 9A to Fig. 9C. Specifically, ~~Fig. 9(a)~~Fig. 9A shows a forced regeneration timing detecting routine.

The paragraph at lines 7-13 has been amended as follows:

A routine shown in ~~Fig. 9(b)~~ Fig. 9B is used for this purpose. In step s11, an intake air amount Qa and a fuel injection amount Qf are downloaded. In step s12, the excess air ratio λ in the time period Δt is calculated on the basis of the downloaded data. In step s13, the excess air ratio frequency γ is calculated by the excess air ratio frequency calculator a2-1' shown in Fig. 8. Finally, the amount MeΔt $\{= f(\gamma\ \Delta t)\}$ } is calculated in step s14.

The paragraph at lines 14-15 has been amended as follows:

The amount MbΔt of particulates burnt in the given time period Δt is calculated in a routine shown in ~~Fig. 9(c)~~Fig. 9C.

The paragraph at lines 23-25 has been amended as follows:

Following the calculations of MeΔt and MbΔt in steps s10 and s20, the amount PM_i of currently accumulated particulates is calculated using PM_{i-1}, MeΔt and MbΔt in step 30. Refer to ~~Fig. 9(a)~~Fig. 9A.

Page 18

The paragraph at lines 7-10 has been amended as follows:

The foregoing alternatives are as effective as the forced regeneration procedure shown in ~~Figs. 9(a) to 9(c)~~Figs. 9A to 9C. The total amount of accumulated particulates can be accurately detected, which is effective keeping the forced regeneration interval in a proper range.

Pages 23-26

Please delete pages 23-26 in their entirety.